APPENDIX 16

LIFE HISTORY AND HABITAT NEEDS OF THE GREATER SAGE-GROUSE

Introduction

Sage grouse are of great interest to many individuals in Wyoming. No other bird is so habitat specific to one particular plant type in meeting its annual life requirements. During the last 20 to 25 year period sage grouse have undergone a severe decline in numbers rangewide. The purpose of this discussion is to provide guidelines that describe high quality habitat to stem the downward trend of sage grouse population numbers.

Life History and Habitat Requirements

Sage grouse are dependent upon sagebrush (*Artemisia* spp.), primarily big sagebrush (*A. tridentata*) and do not occur throughout the year in areas where an abundance of this shrub is absent. Breeding activities generally occur from early March to early May in Wyoming. Sage grouse males have been observed displaying as early as February 9 and as late as May 19 in the Red Desert. Sage grouse males display on leks (strutting grounds) in early morning and late evening to attract hens. The mating system is polygamous where only a few males actually breed. Average numbers of males per lek varies greatly but in areas of good habitat over 200 males have been counted on individual leks in the Great Divide Basin.

Sites chosen for display are openings with an abundance of sagebrush within 300-650 feet for escape cover. These sites may be in low swales or broad ridges and benches. Sites used generally are close to or in large expanses of sagebrush and have good visibility (for predator detection) and acoustical qualities (so sounds of breeding displays will carry). After breeding in March-April (later for hens unsuccessful in their first nest attempt), hens disperse from lek sites and choose nest sites from 650-980 feet to over 5 miles from lek of mating. Recent studies have shown that about 70-80 percent of all hens nest within 5 miles of lek of mating. Nest sites are in taller (> 20 inches), more dense (> 25 percent canopy cover) than average sagebrush areas that have an abundance of forbs (>5-8 percent) and grasses (>20 percent). Residual cover of grasses and forbs is important for nesting hens as few herbaceous plants are growing in mid to late April when hens initiate nesting activities.

Nests are typically placed at the base of a live sagebrush bush. Other shrubs and even clumps of grass have been used for nest cover but sagebrush cover has predominated in all nest studies. Nests occurring under other shrubs or grasses are rarely successful in hatching clutches due to increased predation. Clutch size ranges from 6 to 10 eggs with 7-9 being most common.

Incubation occurs for 27-28 days with sage grouse hens, unlike most grouse, not being determined nesters. Thus, nest abandonment is common if the hen is disturbed during nesting. Extent of re-nesting if the initial clutch is depredated or abandoned varies with population and, probably, with moisture/vegetative conditions. If re-nesting occurs, most hens will re-nest within .6 miles of the original nest site. Clutch size of second nest attempts varies from 4-7 eggs.

Hatching of eggs can start by May 5-10 but most eggs hatch in June with a peak between June 6 and June 23. Clutches hatching after July 1 are usually the result of re-nesting attempts by hens unsuccessful in their initial attempt. Few clutches hatch in July.

Upon hatching their clutches, hens with chicks remain in sagebrush uplands so long as vegetative conditions are adequate. Ideal conditions are those where succulent green forbs and associated insects are abundant, grass cover is sufficiently tall to hide hens and chicks, with some live sagebrush plants for shade and cover. Free water is not required but will be used if available. As chicks mature and vegetation in the sagebrush uplands becomes desiccated, hens with broods, move towards wet meadow areas which may be irrigated hay meadows or riparian areas. Preferred areas are those with an abundance of forbs, grasses for hiding cover, and with live sagebrush along the periphery for escape cover.

The importance of wet meadow and riparian habitats for sage grouse has been repeatedly demonstrated throughout

their range. The results of early studies were used by Colorado Division of Wildlife to recommend leaving a 325 feet strip of live sagebrush around the edges of meadows. More recent study of sage grouse summer habitat use in northwest Colorado indicated that 325 feet was inadequate as sage grouse consistently used a 650 foot strip around wet meadows. They also recommended use of 325 to 700 foot guideline for the interspersion of stand and cover types on sage grouse summer range.

Groups of unsuccessful hens and male flocks follow the same pattern but are less dependent on wet meadows and riparian areas than hens with broods. Summer rainfall decreases use of wet meadows and riparian areas as sage grouse disperse into sagebrush uplands for several days following significant (> 0.2 inches) moisture events. Movements of sage grouse to and from areas with succulent green vegetation are common from July into September.

Cohesion of broods and family units (hens with chicks) decreases in July and August depending upon age of the chicks. Intermixing of broods and flocks in common and becomes pronounced by late August. By early to mid September flocks typically include unsuccessful and successful hens, and chicks from several broods. Adult and yearling males usually occur in separate flocks on benches and along ridges some distance from wet meadows. Areas preferred by all sage grouse from mid September into November are those with denser (>20 percent canopy cover) sagebrush and some green forbs (especially *Eriogonum* spp., *Trifolium* spp., *Taraxacum* spp.)

Movements of sage grouse in the fall and early winter (September-December) can be extensive with some movements exceeding 20 miles. Movements by sage grouse in this allotment are probably not this great. Areas used are extensive stands of sagebrush from north facing slopes (early) to broad flat benches. Leaves of sagebrush are the primary food with preference shown for Artemisia tridentata *wyomingensis*. As winter progresses and, if snow cover becomes extensive (>80 percent) and deep (>12 inches), sage grouse forage in tall (>16 inches) sagebrush and lower flat areas and roost in shorter sagebrush along ridge tops. In periods of extreme cold and deep snow, sage grouse will spend nights and portions of the day when not foraging in snow roosts/burrows which they dig by scratching with their feet or wing movements if the snow has the proper texture. Flock size in winter is variable (15-100+ birds) with flocks frequently being unisexual. Flocks of males are smaller than those of hens but both sexes may make extensive movements to locate suitable foraging and roosting areas. By early March, flocks of sage grouse are usually within 2-3 miles of breeding areas used the previous year.